

WHAT WE CLAIM IS:

Claim 1. A method of designing and manufacturing an artificial joint stem which uses composite materials, comprising steps of performing, as using a computer, an analysis involving an internal stress of said artificial joint stem and an adhesive stress of said artificial joint stem and a bone based on three dimension data indicating a structure of said bone made by using plural bone tomographic images and a design condition involving a form and stiffness of said artificial joint stem configured at least by one of said tomographic images and said three dimension image; having said computer to reanalyze as changing said design condition if a result of said analysis fails to satisfy said design condition; designing and manufacturing said artificial joint stem using stem data based on said result of said analysis and said design condition if said result of said analysis satisfies said design condition.

Claim 2. The method of designing and manufacturing the artificial joint stem with

uses composite materials according to claim 1, wherein an external form of an epiphysis approximately fitting an internal form of an insertion hole formed in said bone, said artificial joint stem has a main part with stiffness around a boundary between epiphysis and diaphysis varies so as to lower the stiffness as approaching the diaphysis and a neck to place a spherical head in said artificial joint thereon.

Claim 3. The method of designing and manufacturing the artificial joint stem which uses composite materials according to claim 2, wherein said artificial joint stem further comprises a guide section, provided at a forefront side of the main part and placed at the diaphysis, said guide section has a lower bending and stretching/tensile stiffness than said main part.

Claim 4. The method of designing and manufacturing artificial joint stem which uses composite materials according to claim 1, further comprising step of analyzing the internal stress of said bone using the finite element method.

Claim 5. The method of designing and manufacturing artificial joint stem which uses the composite materials according to claim 1, further comprising a step of forming a model of said artificial joint stem or a forming die.”

Claim 6. The method of designing and manufacturing artificial joint stem which uses the composite materials according to claim 1, further comprising a step of obtaining a material of the composite materials for the use in forming said artificial joint stem as controlling an automatic cutter based on the stem data.

Claim 7. The method of designing and manufacturing artificial joint stem which uses the composite materials according to claim 1, further comprising a step of displaying a lamination layer position of the composite materials used in forming said artificial joint stem in a forming die of said artificial joint stem based on the stem data.